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Workers Laid-off During the Last Three Recessions: Who Were They, and How Did They Fare?

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..	not available for a specific reference period
...	not applicable
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0^s	value rounded to *0* (zero) where there is a meaningful distinction between true zero and the value that was rounded
^{p}	preliminary
^{r}	revised
x	suppressed to meet the confidentiality requirements of the *Statistics Act*
^{E}	use with caution
F	too unreliable to be published
*	significantly different from reference category ($p < 0.05$)

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Abstract

Over the last three decades, Canada has experienced three recessions: one that started during the early 1980s; a second that began during the early 1990s; and the most recent one, which led to employment declines starting in October 2008. For each recession, this study: a) examines which workers were laid-off; b) quantifies layoff rates; and c) assesses the proportion of workers that found a job shortly after being laid-off. The layoff concept used includes temporary layoffs as well as permanent layoffs.

The study shows that the most recent recession was associated with lower layoff rates and higher short-term re-employment rates (following layoffs) than the previous two recessions. It was also of shorter duration. Total employment took 27 months to return to its pre-downturn level, compared to 53 months during the early 1990s and 40 months during the early 1980s. While newly hired workers had a higher risk of layoff than high-seniority workers during all three recessions, the former saw their layoff rates drop significantly during the most recent downturn. In contrast, layoff rates of high-seniority workers did not fall during the most recent downturn. As a result, high-seniority workers—a group that tends to experience substantial and sustained earnings losses—accounted for a greater share of all laid-off workers during the most recent downturn than during the downturns of the early 1990s and of the early 1980s.

Keywords: worker displacement; layoffs; employment; job loss; wage losses

Executive summary

Between October 2008 and July 2009, total employment fell by more than 400,000 in Canada. By January 2011, total employment had returned to the level observed in October 2008. Which workers were laid-off during this recession? To what extent did these workers differ from their counterparts who were laid-off during the recessions that took place during the early 1980s and the early 1990s? How many of them found a job shortly after being laid-off? Among those who were re-employed shortly after being laid-off, which ones, if any, experienced substantial pay cuts? This article uses data from Statistics Canada's Labour Force Survey to answer these questions.

The study uncovers several key patterns.

Compared with their counterparts who were permanently or temporarily laid-off during the early 1980s and the early 1990s, Canadian workers laid-off during the most recent recession were older, better educated, and less likely to come from the manufacturing sector. These temporal changes in the profile of laid-off workers resulted mainly from compositional effects, i.e., changes in the age/education profile of the Canadian workforce as well as the secular decline of the manufacturing sector.

Canadian workers were less likely to be laid-off during the most recent downturn than their counterparts were in the early 1980s and the early 1990s. Assessed on a monthly basis, the risk of layoff during the early 1980s averaged 2.9%; this rate is almost 1.5 times higher than the 2.0% rate observed in 2008-to-2011. The risk of layoff averaged 2.7% in the early 1990s.

During all three periods considered, chances of being temporarily or permanently laid-off were relatively high among young workers (those aged 15 to 24), individuals with no university degree, newly hired employees (those with two years or less of seniority), and those employed in the goods sector. However, such patterns are not specific to periods of economic slowdown: they are also observed during expansionary periods.

Of all workers laid-off in the 2008-to-2011 period, 50% found a paid job between one and four months after being displaced. This share was significantly higher (both statistically and quantitatively) than the corresponding proportion of 42% observed during the previous two recessions.

The workers most likely to be re-employed in the short term had the following characteristics: they initially expected to be recalled; they had a university degree; and they had more than five years of seniority.

On average, employees who were laid-off during the most recent downturn and who found a job shortly after being laid-off saw their average weekly wages drop from $734 to $703. However, one-quarter saw their weekly wages drop by 23% or more, while another one-quarter saw increases in weekly pay of at least 18%.

Average declines in weekly wages amounted to at least 10% for the following workers: those who lost union coverage; those who moved from a firm with at least 100 employees to a smaller firm; and those who changed both industry and occupation in the new job. Collectively, these groups represented about one-quarter of laid-off workers who were re-employed during the most recent recession. In contrast, employees who gained union coverage or moved from firms with fewer than 100 employees to firms with 100 or more employees registered average gains in weekly wages of between 8% and 11%. Collectively, the latter two groups represented about 17% of laid-off workers who were re-employed during the most recent recession.

Apart from displaying lower layoff rates and higher short-term re-employment rates than the previous two recessions, the most recent downturn was of shorter duration. Total employment (seasonally adjusted) took 27 months to return to its pre-recession level, compared to 53 months during the early 1990s and 40 months during the early 1980s.

While newly hired employees had a higher risk of layoff than high-seniority workers during all three recessions, the former saw their layoff rates drop significantly during the most recent downturn. In contrast, layoff rates of high-seniority workers did not fall during the most recent downturn. As a result, a greater proportion (28%) of workers laid-off during the most recent recession, than of workers laid-off during the recession of the early 1990s (17%) or the recession of the early 1980s (16%), had high seniority. Since high-seniority workers tend to experience substantial and sustained earnings losses, an important question for future research is whether the long-term average earnings losses of workers displaced during the most recent downturn will end up being higher or lower than those of their counterparts displaced during the early 1980s and the early 1990s.

1 Introduction

Over the last three decades, Canada has experienced three recessions. As a result of these, unemployment rates rose sharply in 1981-to-1983, 1990-to-1992, and, most recently, after October 2008. To shed light on the labour market implications of these slowdowns, this study answers four questions:

1. Which workers were laid-off during these recessions?
2. How did layoff rates vary across recessions?
3. How did chances of finding employment shortly after being laid-off evolve across recessions?
4. Among workers who managed to find paid employment shortly after being laid-off, how do wages before and after layoffs compare?

Since the last three decades have witnessed important movements in the composition of employment by industry, workers' age, and workers' educational attainment, the study first assesses the degree to which: a) workers laid-off during the last recession differed from their counterparts laid-off in the early 1980s and the early 1990s; and b) temporal changes in the profile of laid-off workers can be accounted for by the aforementioned compositional effects. Layoff rates in each recession are also provided.

Next, the likelihood of laid-off workers finding employment in the short term, i.e., in a period ranging from one month to four months after layoff, is assessed. Whether the factors that facilitate or impede short-term re-employment are different now than they were in the early 1980s and in the early 1990s is also investigated.

Finally, hourly wages and weekly wages before and after layoffs are compared. Considerable attention is devoted to documenting the fact that laid-off workers experience fairly heterogeneous short-term wage changes, with substantial shares experiencing either wage gains or substantial wage losses. As a result of data limitations, the aforementioned comparison is done only for the most recent downturn.

To examine the four questions identified above, the study takes advantage of the panel nature of the Labour Force Survey (LFS), whereby households are interviewed in each of six consecutive months. However, while the LFS asks laid-off workers whether they expect to be recalled, it does not collect information on whether they actually return to the same employer (regardless of their recall expectations). Hence, the data do not allow permanent and temporary layoffs to be differentiated, whereas this is the case in Statistics Canada's Longitudinal Worker File (LWF)—another data source used to study job displacement. As a result, the layoff concept used in this article includes both temporary and permanent layoffs and thus is not equivalent to the concept of job loss (due to permanent layoffs) used in previous studies based on the LWF (e.g., Morissette 2004; Morissette, Zhang, and Frenette 2007). Despite this limitation, LFS data help paint a rich picture of the determinants and short-term consequences of layoffs during the last three recessions. The main findings can be summarized as follows.

Canadian workers were less likely to be laid-off during the most recent recession than their counterparts were in the early 1980s and the early 1990s. Assessed on a monthly basis, the risk

of layoff during the early 1980s averaged 2.9%; this rate is almost 1.5 times higher than the 2.0% rate observed in 2008-to-2011. The risk of layoff averaged 2.7% in the early 1990s.[1]

During all three periods, chances of being temporarily or permanently laid-off were relatively high among young workers (those aged 15 to 24), individuals with no university degree, newly hired employees (those with two years or less of seniority), and those employed in the goods sector. However, such patterns are not specific to periods of economic slowdown: they are also observed during expansionary periods.

Comparing the risk of layoff associated with various characteristics across the three recessions, the study found that workers laid-off during the most recent recession were older, better educated, and less likely to come from the manufacturing sector than those laid-off during the early 1980s or the early 1990s. These temporal changes in the profile of laid-off workers resulted mainly from compositional effects, i.e., changes in the age/education profile of the Canadian workforce as well as the secular decline of the manufacturing sector.

However, compositional effects did not account for all changes in the profile of laid-off workers. For instance, employees laid-off in 2008-to-2011 had more seniority than their counterparts laid-off in the early 1980s and the early 1990s, even after controlling for changes in the seniority profile of the Canadian workforce. All else equal, high-seniority workers (those with more than five years of seniority) were less likely to be laid-off than newly hired employees (those with two years or less of seniority) during all three downturns. However, the average seniority of workers laid-off—measured in terms of the likelihood of being laid-off—was smaller during the most recent downturn than during the previous two. When controls for individual characteristics are applied, high-seniority workers were about 6-percentage-points less likely to be laid-off than newly hired employees during the early 1980s and the early 1990s. In contrast, the corresponding difference dropped to 3.0 percentage points in 2008-to-2011, as the risk of layoff of newly hired employees fell over time.

Of all workers laid-off in the 2008-to-2011 period, 50% found a paid job between one and four months after being displaced. This share is significantly larger (both statistically and quantitatively) than the corresponding proportion of 42% observed during the previous two recessions.

The workers most likely to be re-employed in the short term had the following characteristics: they initially expected to be recalled; they had a university degree; and they had more than five years of seniority.

On average, employees who were laid-off during the most recent recession and who found a job shortly after being laid-off saw their average weekly wages drop from $734 to $703. However, one-quarter saw their weekly wages drop by 23% or more, while another one-quarter saw increases in weekly pay of at least 18%.

Average declines in weekly wages amounted to at least 10% for the following workers: those who lost union coverage; those moved from a firm with at least 100 employees to a smaller firm; and those who changed both industry and occupation in the new job. Collectively, these groups represented about one-quarter of laid-off workers who were re-employed during the most recent downturn. In contrast, employees who gained union coverage or moved from firms with fewer than 100 employees to firms with 100 or more employees registered average gains in weekly

1. As mentioned above, these numbers include both temporary and permanent layoffs. As will be shown below, annual estimates of the total number of temporary and permanent layoffs obtained from the LFS are, during the 1978-to-2007 period, fairly similar to those obtained from the LWF. Since estimates of the number of permanent layoffs from the LWF currently end in 2007, they cannot be used to quantify permanent layoff rates during the most recent downturn.

wages that amounted to between 8% and 11%. Collectively, these groups represented about 17% of laid-off workers who were re-employed during the most recent downturn. Previous studies have shown that high-seniority workers who are laid-off often experience substantial and sustained earnings losses (Jacobson, Lalonde, and Sullivan 1993; Morissette, Zhang, and Frenette 2007; Couch and Placzek 2010). Given that a larger proportion (28%) of laid-off workers had high seniority during the most recent recession than during the early 1990s (17%) or the early 1980s (16%), an important question for future research is whether the long-term earnings losses of workers displaced during the most recent downturn will end up being higher or lower than those of their counterparts displaced during previous downturns.

Apart from displaying lower layoff rates and higher short-term re-employment rates than the previous two recessions, the most recent downturn was also of shorter duration. Total employment (seasonally adjusted) took 27 months to return to its pre-downturn level, compared to 53 months during the early 1990s and 40 months during the early 1980s.

The lower layoff rates observed during the last recession mirrored the relatively small peak-to-trough employment decline observed in recent years. As pointed out by Cross (2011), the peak-to-trough decline in employment observed in 2008–2009 amounted to 2.4%, compared to 5.4% in the early 1980s and 3.4% in the early 1990s.[2]

The paper is organized as follows. The data used in the analysis are described in Section 2. Section 3 sketches a profile of workers laid-off during the last three recessions. Section 4 compares layoff rates across recessions. Section 5 documents the evolution of employment rates shortly after layoff. Section 6 quantifies the wage changes experienced by employees who were laid-off during the most recent recession and who found a job shortly after being laid-off. Concluding remarks follow.

2 Data

The data used in the current study are drawn from the master file of Statistics Canada's Labour Force Survey (LFS). The LFS is a rotating panel survey in which households are interviewed for six consecutive months.[3] The total sample consists of six representative sub-samples, one of which is replaced each month after it has completed the six-month stay in the survey. This rotation results in a five-sixths month-to-month sample overlap, which in turn allows estimates of month-to-month changes in labour force status. To take advantage of the panel nature of the

2. In absolute terms, the peak-to-trough employment decline amounted to roughly 610,000 in the early 1980s, compared to roughly 440,000 in the early 1990s and roughly 430,000 in the last recession (CANSIM Table 282-0087).
3. The LFS sample is drawn from an area frame and is based on a stratified, multi-stage design that uses probability sampling. In addition to adjustments for the probability of being surveyed and for non-response, stratification and clustering in the sample design are also required in order to produce proper standard error of the estimates. The authors thank Emmanuel Benhin and Scott Meyer, both of Statistics Canada, for useful information related to this adjustment. More details are provided in Appendix C.

data, a (pseudo) individual identifier is created in order to identify a given individual within the LFS panel.[4]

To identify which workers have been laid-off during the last three recessions and to assess how chances of being laid-off varied across recessions, the following sample is constructed. For each of the three recessions, the months observed between the onset of the employment downturn and the return to the pre-downturn level are chosen on the basis of seasonally-adjusted total employment. As a result, the "peak-to-peak" periods for the aforementioned downturns are the following: June 1981 to October 1984; April 1990 to September 1994; and October 2008 to January 2011.[5] For this reason, the study refers to the most recent recession as *the 2008-to-2011 period.*

To calculate layoff rates on a monthly basis, monthly transitions from paid employment to non-employment due to layoffs are captured. For each pair of months selected, inflows into non-employment (due to layoffs) between month *t-1* and month *t* are divided by the number of workers in paid employment in month *t-1*. This yields month-specific layoff rates. Averaging these month-specific layoff rates across all pairs of months observed during the peak-to-peak periods yields a layoff rate for a given economic downturn.[6] This layoff rate is calculated for a sample of paid workers who are aged 15 to 64 in the month preceding the layoff and who are not full-time students. More details about the identification of laid-off workers are provided in Appendix B.

The layoff rates shown in this study differ from those published in Morissette (2004) and in Morissette, Zhang, and Frenette (2007) for two reasons. First, the aforementioned studies focused on permanent layoffs and, thus, excluded temporary layoffs. While the LFS asks laid-off workers whether they expect to be recalled, it cannot assess whether a worker laid-off in year *t* actually returns to the same employer in year *t* or in year *t+1* (no matter what that individual's recall expectations are). Hence, it cannot differentiate between permanent and temporary layoffs as these terms are defined in the LWF.[7] Second, the layoff rates presented in this study are calculated on a monthly basis. In contrast, the layoff rates presented in the studies above were calculated on an annual basis. While the number of workers at risk of being laid-off (i.e., the denominator in the calculation of layoff rates) differs relatively little whether calculations are

4. Without an individual identifier in the Labour Force Survey Master File, a (pseudo) individual identifier is created by combining the household identifier (*HHLDID*), the rotation number identifier (*ROTATION*), a sequential number assigned to every dwelling within a cluster (*LISTLINE*), a code used for structures that have more than one dwelling (*MULT*), a sequential number that uniquely identifies a person within a household (*LINE*), and a family identifier that uniquely assigned an economic family to a household (*FAMID*). Given that each individual should be followed for, at most, six consecutive months, a handful of observations were dropped when the particular individual identifier was linked to more than six records in the data (0.01% in the 1981-to-1984 data, 0.03% in the 1990-to-1994 data, and no such observations in the 2008-to-2011 data). Among the individual identifiers that were linked to six records or less in the data, reported individual characteristics were checked to ensure that they were recorded consistently across the sampling months. This was done in order to ascertain that the linked records belonged to the same individual. Specifically, individuals with change in reported sex, individuals with an increase in reported age of more than one year, and individuals with change in the highest education attainment to a lower level within the six survey months were dropped. Such occurrences were rare, however (0.30% among the 1981-to-1984 data, 0.25% among the 1990-to-1994 data, and 0.78% among the 2008-to-2011 data).
5. From CANSIM Table 282-0089, the seasonally-adjusted total employment number is as follows: 11,375,600 in June 1981 and 11,386,700 in October 1984; 13,140,800 in April 1990 and 13,176,600 in September 1994; and 17,175,100 in October 2008 and 17,214,500 in January 2011.
6. Non-employment includes both the unemployed and those who dropped out of the labour force.
7. In the LWF, a temporary (permanent) layoff occurs when a laid-off worker does (does not) return to his/her employer during the same year or during the year following the layoff.

made on a monthly basis or on an annual basis, the number of workers being laid-off is, as expected, much smaller when the time interval considered is one month rather than one year.[8]

To investigate how chances of finding paid employment shortly after being laid-off evolved across downturns and to quantify the wage changes of laid-off workers who found paid employment shortly after being laid-off, the study takes advantage of the fact that the LFS follows workers for six months.

The sample used for this portion of the analysis consists of individuals who: a) are observed in all six consecutive months in each panel; b) are aged 15 to 64 in all six months; c) are not full-time students in any of the six months; d) are employed as paid workers during the first month of the panel; and e) have been laid-off at any point between the second month and the fifth month.[9] The percentage of these workers who are re-employed during the sixth month and the magnitude of the wage changes and changes in usual weekly hours experienced by those who are re-employed are then measured.

Short-term re-employment rates—employment rates observed between one and four months after layoffs—are compared across all three downturns.[10] In contrast, wage changes are examined only for the most recent downturn. The reason is that LFS information on wages is available only for 1997 and subsequent years. To put numbers into context, wage changes during the 2008-to-2011 period are compared with those observed in the expansionary period that immediately preceded the beginning of the downturn. Twenty-three (six-month) panels from July 2006 to October 2008 are constructed for this purpose.

3 Which workers were laid-off during the last three recessions?

3.1 Background

As is well known, Canadian workers became older, better educated, and more likely to be employed in the service sector over the last three decades. As a result, the profile of workers laid-off in a given downturn may have changed over time. This question is investigated in Table 1.

Workers laid-off in 2008-to-2011 differed from their counterparts laid-off in the early 1980s and early 1990s in several ways: the former group was older and better educated and had more years of seniority in the job.

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8. Since one of the goals of the study is to compare layoff rates across downturns and since peak-to-peak employment periods cross calendar years, averages of month-specific layoff rates (rather than year-specific layoff rates) have to be used.
9. A worker is defined as being laid-off if he/she had been laid-off at least once between the second month and the fifth month of the survey. This includes individuals with multiple layoffs. Cases of multiple layoffs are relatively rare: they amount to about 4% of the sample of individuals who had been ever been laid-off between the second month and the fifth month.
10. This is done by selecting workers whose first month of interview is observed during a "peak-to-peak" period and by using the following sets of panels: 40 (six-month) panels from June 1981 to February 1985; 53 panels from April 1990 to January 1995; and 23 panels from October 2008 to January 2011. January 2011 is the most current LFS data that could be accessed at the time that the paper was written. The LFS data from October 2008 to January 2011 allow for calculating the "peak-to-peak" layoff rate for the 2008-to-2011 period. However, in order to follow workers for the full six-month panel for the December 2010 cohort, LFS data up to May 2011 are needed. The current paper therefore can follow the workers whose first month of interview took place between October 2008 and August 2010 in order to examine the short-term consequence following their layoffs for the most recent downturn.

Almost 40% of workers laid-off during the most recent downturn were aged 45 or older, twice the rate of 19% observed in the early 1980s. Meanwhile, the share of laid-off workers who were aged 15 to 24 declined from 35% to 19%.

Sixteen percent of workers laid-off in the 2008-to-2011 period had a university degree, compared to 8% in the early 1990s and 5% in the early 1980s.[11] Twenty-eight percent had more than five years of seniority, up from 16% in the early 1980s.

The two most populous provinces registered significant changes in the share of laid-off workers, albeit in different directions. While Quebec and Ontario accounted for about 60% of laid-off workers in all three downturns, Ontario's share rose from roughly 30% during the first two downturns to 36% in 2008-to-2011. Meanwhile, Quebec's share fell from about 30% to 25%.

The industrial and occupational profile of laid-off workers also changed over time.[12,13] In the early 1980s, 46% of laid-off workers came from primary industries, construction, and manufacturing. The corresponding proportions fell to 43% in the early 1990s and to 38% during the most recent downturn. In contrast, relatively more professionals, semi-professionals, and technicians were laid-off in the most recent downturn (19%) compared to the early 1990s (13%).[14]

Despite the growing proportion of women in the workforce (Text Table A2), the proportion of men and women laid-off remained fairly stable across all three downturns, as women accounted for between 40% and 43% of all laid-off employees.

3.2 Compositional effects

As Text Table A1 shows, changes in the profile of laid-off workers by age, educational attainment, and industry were also observed across expansionary periods. Such changes are expected, since—as was mentioned above—Canadian workers became older, better educated, and less likely to be employed in the goods sector over the last three decades (Text Table A2).

To what extent are changes in the profile of laid-off workers driven by these compositional effects? Table 2 answers this question by using shift-share analyses. The question asked is the following: what would the age (education, seniority, industrial) profile of laid-off workers have been in the 2008-to-2011 period if the age (education, seniority, industrial) profile of paid workers had remained as it was in 1981-to-1984?

For instance, the proportion of laid-off workers aged 45 to 64 increased by almost 20 percentage points between 1981-to-1984 and 2008-to-2011 (Table 2, column 3). Had the distribution of employment by age remained unchanged, the increase would have amounted to only about 3 percentage points (column 4). Thus, the aging of the workforce accounts for at

11. As a result of the introduction of a new set of LFS questions measuring educational attainment in 1990, detailed information on education levels for years prior to 1990 is not comparable to that measured for subsequent years. As a result, only the disaggregation used in Table 1 can be presented.
12. Industries are aggregated into the following six categories based on the North American Industry Classification System (NAICS) 2002 codes: 1) "Primary industries and construction" include agriculture, forestry, fishing, mining, oil and gas, utilities, and construction; 2) "Manufacturing"; 3) "Retail trade, accommodation, and food services"; 4) "High-skill services" include finance, insurance, real estate, and leasing, as well as professional, scientific, and technical services, business, building, and other support services; 5) "Public services" include education services, health care and social assistance, and public administration; 6) "Other service-producing industries" include wholesale trade, transportation and warehousing, performing arts, heritage, and amusement.
13. Occupations are aggregated into the following five categories based on the National Occupational Classification for Statistics (NOC-S) 2001 codes: 1) Management; 2) Professionals; 3) Semi-professionals and technicians; 4) Clerical, sales, and service personnel; 5) Manual workers and trades personnel. See Appendix D for details.
14. In the LFS, standard NOC-S 2001 occupational codes are available from 1987 to the present. Therefore, the occupation comparison can be done only between the 1990-to-1994 and 2008-to-2011 downturns.

least 80% (17 percentage points out of 20) of the growth in the proportion of laid-off workers aged 45 to 64 between the early 1980s and the most recent downturn.

A comparison of columns 3 and 4 also reveals that increases in workers' educational attainment explain about 80% of the increase in the proportion of laid-off workers holding a university degree. Likewise, decreases in the relative importance of manufacturing employment fully account for the drop in the proportion of laid-off workers coming from manufacturing, while increases in the relative importance of high-skill services account for almost two-thirds of the rise in the share of laid-off workers originating from this sector.

While movements in the composition of the workforce and in the industrial structure drove most of the changes in the composition of laid-off workers by age, education, and industry,[15] they explain little of the growth in the proportion of laid-off workers with high seniority. The share of laid-off workers with more than five years of seniority grew by about 12 percentage points between the early 1980s and 2008-to-2011 (Table 2, column 3). Had the distribution of employment by seniority levels remained unchanged at its 1981-to-1984 levels, the corresponding increase would have amounted to 10 percentage points (Table 2, column 4). Thus, most of the increase in the share of high-seniority laid-off workers would have occurred in the absence of compositional effects. This in turn suggests that most of this growth was driven by differential changes in layoff rates across seniority levels. Table 3 supports this contention: between 1981-to-1984 and 2008-to-2011, layoff rates fell among workers with at most five years of seniority but not among their counterparts with greater seniority.

Likewise, Table 2 indicates that the whole increase (5.0 percentage points) in Ontario's share of laid-off workers would have occurred even had the distribution of employment by region remained stable over time. In an accounting sense, the growing proportion of laid-off workers coming from Ontario is due to the fact that, relative to the Canadian average, layoff rates in Ontario grew substantially between 1981-to-1984 and 2008-to-2011 (Text Table A3).

In sum, changes in the composition of the workforce and employment shifts across industries generally accounted for most of the changes in the profile of laid-off workers between 1981-to-1984 and 2008-to-2011. However, changes in relative layoff rates altered significantly the proportion of high-seniority laid-off workers as well as the proportion of laid-off employees coming from Ontario or previously employed in retail, trade, accommodation, and food services. These conclusions hold when alternative counterfactuals, which assume a stable composition of paid employment between the early 1990s (rather than the early 1980s) and 2008-to-2011, are considered (Text Table A4).

4 How did layoff rates vary across recessions?

4.1 Descriptive evidence

Overall, Canadians' chances of being laid-off were lower during the most recent employment downturn than during the previous two. Measured on a monthly basis, the aggregate layoff rate in 2008-to-2011 averaged 2.0%, compared to 2.7% for the early 1990s and 2.9% for the early

15. One exception is retail trade, accommodation, and food services, which registered a 2-percentage-point drop in the share of laid-off workers, most of which would have taken place even in the absence of changes in the composition of employment by industry (Table 2, columns 3 and 4).

1980s (Table 3 and Chart 1).[16] Once again, these statistics include temporary as well as permanent layoffs.[17]

In most demographic groupings considered, layoff rates were lower in 2008-to-2011 than in 1981-to-1984 or in 1990-to-1994. A few exceptions must be noted. University graduates and workers with more than five years of seniority did not experience a lower risk of layoff in 2008-to-2011, compared to the previous two downturns. As a result, these groups also saw an increase in their relative layoff rates, i.e., their layoff rates divided by the overall layoff rate (Text Table A3).

Workers most likely to be laid-off during the most recent downturn were male, were aged 15 to 24, had two years or less of seniority with the firm, had no university degree, were living in the Atlantic Provinces, and were employed in primary industries and construction.

For instance, layoff rates among workers aged 15 to 24 amounted to 3.4%, twice the rate of 1.7% found among their counterparts aged 35 to 44. With a layoff rate of 3.6%, newly hired employees (those with two years or less of seniority) were three times more likely to be laid-off than their counterparts with 10 to 20 years of seniority. Non-university graduates had monthly layoff rates of 2.2%, while the rate for university graduates was 1.2%.

However, all of these qualitative patterns were also found during previous downturns (Table 3) as well as during previous expansionary periods.[18]

4.2 Determinants of the probability of being laid-off

To control for the influence of potential confounders, Table 4 presents the marginal effects from a logit model of the probability of being laid-off. The dependent variable equals *1* (one) if a worker has been laid-off, *0* (zero) otherwise. The set of explanatory variables consists of a gender indicator, a quadratic term in age, a binary indicator for university graduates, seniority indicators, region indicators, and broad industry controls.

The results of this multivariate analysis confirm the findings of Section 4.1: all else equal, young workers, individuals with two years or less of seniority, workers employed in primary industries and construction, and those living in the Atlantic Provinces faced the highest layoff risk during the last downturn as well as during the previous two downturns.

All else equal, workers with a university degree were less likely to be laid-off than other workers. The difference in layoff risk amounted to 0.9 percentage points during the most recent downturn; this is down from 2.0 percentage points during the early 1980s (Table 4).

Workers with more than five years of seniority were less subject to layoffs than newly hired employees. However, the difference in the likelihood of being laid-off narrowed over time, dropping from 6.4 percentage points in the early 1980s to 3.0 percentage points during the most recent downturn. The difference narrowed mainly because newly hired employees saw their

16. The difference between the 2008-to-2011 layoff rate and the layoff rates of previous periods is statistically significant at conventional levels.
17. Text Table B1 shows that LFS estimates of the total number of layoffs are fairly similar to those obtained from the LWF. During the period 1978-to-2007, the total number of (permanent and temporary) layoffs per year averaged 2.5 million with the LFS, compared to 2.7 million with the LWF. While the estimated number of layoffs from LWF changed little between 1996 and 1997, the estimated number of layoffs from the LFS fell by roughly 15% between these two years. This suggests that the 1997 redesign of the LFS led to a reduction in the estimated number of layoffs. Scaling up the 2008-to-2011 average monthly layoff rate of 2.0% by a factor of 1.15 yields a revised layoff rate of 2.3%, which is still lower than the average monthly layoff rates observed during the previous two downturns.
18. The relevant tabulations for expansionary periods are available upon request.

layoff rate drop by at least 2.0 percentage points between the first two downturns and the most recent one (Table 3).[19]

On a monthly basis, inter-regional (absolute) differences in the probability of being laid-off were less pronounced during the most recent downturn than during previous ones. They reached a maximum of 1.6 percentage points in 2008-to-2011, compared to 1.9 percentage points in the early 1980s and 2.2 percentage points in the early 1990s.[20] In all periods, Quebec and the Atlantic Provinces displayed a higher risk of layoff than Ontario and Alberta. However, these inter-regional differences narrowed during the most recent downturn, reflecting the differentiated impact of the last downturn across provinces. For instance, the probability of being laid-off was only 0.2-percentage-points higher in Quebec than in Ontario during the most recent downturn, compared to 1.0-percentage-point higher during the early 1980s and 1.1-percentage-points higher during the early 1990s. Likewise, differences in the risk of layoff between Quebec and Alberta fell from 1.4 percentage points during the early 1980s and the early 1990s to 0.8 percentage points during the most recent downturn. Contrary to Quebec and the Atlantic Provinces, Alberta consistently exhibited lower layoff risks than Ontario. However, the difference in layoff risk between Alberta and Ontario did not narrow during the most recent downturn. British Columbia, which was hit fairly hard during the downturn of the early 1980s, had a higher risk of layoff than Ontario in 1981-to-1984, but this was not the case in 2008-to-2011. All else equal, the risk of layoff was 0.5-percentage-points lower in the Prairie Provinces than in Ontario during the most recent downturn.

In all three downturns, chances of being laid-off were at least 2-percentage-points lower in service-producing industries than in primary industries and construction. Workers in manufacturing were also less likely to be laid-off than their counterparts in primary industries and construction: the difference varied between 1.7 percentage points and 2.9 percentage points, depending on the downturn considered.

Overall, Table 4 confirms that, during all three downturns, workers' risk of being laid-off varied consistently across the following dimensions: age, education, seniority levels, region, and industry.[21]

19. Calculations of probabilities of being laid-off for both groups of workers, conditional on time-invariant means of other explanatory variables, confirm this point.
20. This can be seen by comparing the (positive) marginal effect for the Atlantic Provinces to the most negative marginal effect observed among the remaining provinces/regions.
21. Gender differences are also observed, but they are not qualitatively stable over time. Women were slightly more likely than men to be laid-off during the first two downturns; this was not the case with the most recent one, however.

5 How did chances of finding paid employment shortly after being laid-off vary across recessions?

Of all paid workers who were laid-off in 2008-to-2011, half of them found a paid job between one month and four months after being laid-off (Table 5). This percentage is higher than the corresponding proportion of roughly 42% observed during the early 1980s and the early 1990s (Chart 2).[22,23]

For many groups of workers, short-term employment rates following layoffs were higher in 2008-to-2011 than during the previous two downturns. Compared to those in the early 1980s and the early 1990s, employment rates in 2008-to-2011 rose by between 5.0 percentage points and 13.0 percentage points among male and female workers. They grew by at least 9.0 percentage points for younger workers (aged 34 or younger) and by at least 6.0 percentage points for older workers (aged 35 or older). For workers with education attainment below university, the employment rate rose by about 7 percentage points; among university graduates, the increase is between 8.0 percentage points and 12.0 percentage points. For workers with low seniority (two years or less), the increase in employment rate is about 6 percentage points. The rates grew by at least 10.0 percentage points for workers in the Atlantic Provinces, Quebec, and the Prairie Provinces. Workers employed in public services at the time of layoff also saw their employment rates increase by at least 10.0 percentage points.

For other groups, employment rates after layoffs showed relatively little improvement. This was the case for workers with high job tenure (more than five years), workers living in Ontario, Alberta, and British Columbia, as well as those employed in manufacturing and high-skill services.

Short-term employment rates also varied across worker characteristics. This is shown in Table 6, where a multivariate analysis of the probability of being re-employed is conducted. All else equal, laid-off workers who expected to be recalled were at least 14-percentage-points more likely to find a paid job in the short term than those who expected no recall.[24] Employees with a university degree had greater chances of finding paid employment in the short run than others (the difference amounted to about 5 percentage points).

The likelihood of high-seniority workers experiencing relatively high short-term re-employment rates evolved differently across groups. High-seniority workers who expected to be recalled were more likely to be re-employed than their counterparts newly hired in the first two downturns: the re-employment rates of the former group exceeded those of the latter by 6.0 percentage points to 7.0 percentage points during the first two downturns and by about 3 percentage points (imprecisely measured) in 2008-to-2011. Among workers who did not expect a recall, this seniority advantage amounted to 9.0 percentage points in the early 1980s, to 6.0 percentage points in the 1990s, and to 8.0 percentage points in 2008-to-2011.

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22. The difference between the re-employment rate of 2008-to-2011 and the re-employment rates of previous downturns is statistically significant at conventional levels. Adding the set of explanatory variables shown in Table 6 to a vector of period effects in a regression that pools data from all three downturns indicates that about 17% of the increase in employment rates between the early 1980s and the most recent downturn can be accounted for by changes in the composition of laid-off workers by age, education, seniority, region, and industry of employment. Adding only a binary indicator for being a university graduate (in a regression that pools data from all three downturns) suggests that about 4% of the increase in employment rates between the early 1980s and 2008-to-2011 can be accounted for by the growing proportion of university graduates observed over the last three decades.
23. The proportion of laid-off employees who became self-employed shortly after being laid-off amounted to 1% during the first two downturns and to 2% during the most recent one.
24. Table 6 presents regression results from a linear probability model of re-employment. Similar results were obtained by using logit models and probit models.

In general, employment rates varied little across industries. Public services were a notable exception. In all three downturns, workers laid-off from public services were at least 10-percentage-points more likely to be employed shortly after layoffs than workers in primary industries and construction. Further research is needed to uncover other sources underlying this difference.[25]

As expected, workers who were laid-off in the fourth month or the fifth month of the LFS interview were less likely to have a paid job during the sixth month than their counterparts laid-off during the second month of the LFS interview.

Different downturns affected regions differentially. Among comparable employees, the likelihood of being employed shortly after a layoff was consistently lower for workers laid-off in the Atlantic Provinces than for their counterparts laid-off in Ontario. However, the difference narrowed over time. In contrast, workers laid-off in the Prairie Provinces were more likely to be employed in the short term than those laid-off in Ontario in 2008-to-2011, although this was not the case during the early 1980s.

6 How do wages before and after layoffs compare?

Since LFS information on wages is available only for 1997 and subsequent years, the question of how wages before and after layoffs compare is examined only for 2006-to-2008 and 2008-to-2011.

Workers who were laid-off during the most recent downturn and found a job shortly thereafter experienced, on average, a slight drop in employment income. Average weekly wages declined from $734 to $703 (in 2008 dollars) (Table 7), and the average hourly wage fell from $20.9 to $20.4. Fairly similar declines are observed in 2006-to-2008.

Yet these averages mask considerable heterogeneity in wage changes (Figure 1). During the most recent downturn, one-quarter of re-employed laid-off workers saw their weekly wages fall by 23% or more (Table 8, Panel A). Another one-quarter registered increases in weekly pay of at least 18%. Similarly, one-quarter of these workers saw their hourly wage drop by at least 13%, while another one-quarter experienced hourly-wage increases of at least 11% (Table 8, Panel A).

Measuring wage movements by using average changes in log wages, Table 9 shows that average wage changes were fairly similar in 2006-to-2008 and 2008-to-2011.

On average, managers, workers with more than 20 years of seniority, and those laid-off from high-skill services experienced weekly wage losses of at least 10% during the most recent downturn. In contrast, workers laid-off from retail trade, accommodation, and food services experienced gains in weekly pay of about 14%.

25. The use of contract workers in the public sector is one consideration. Of all workers laid-off from public services during the most recent downturn, about 30.1% were in temporary, term, or contract jobs. This is three times the rate of 9.9% observed for workers laid-off from other industries. However, adding a binary indicator measuring whether the end of a job is related to a temporary, term, or contract job reduces the coefficient estimate for public services only slightly in 2008-to-2011 (from 21.9 percentage points to 21.3 percentage points). Since this indicator is not available during earlier periods, this alternative specification cannot be replicated for the early 1980s and the early 1990s.

Workers who lost union coverage while moving across jobs experienced, during the most recent downturn, average hourly-wage losses of 16% and average weekly-wage losses of 17% (Table 10).[26] Workers who moved from a firm with at least 100 employees to a smaller firm had hourly-wage and weekly-wage losses that averaged 11% and 15%, respectively. Workers who changed both occupation and industry saw their weekly wages fall by 10%, on average.[27] In contrast, employees who gained union coverage or moved to firms with 100 or more employees registered average gains in weekly wages of between 8% and 11%.[28]

To assess the degree to which average wage losses vary with worker and job characteristics, changes in log hourly wages and changes in log weekly wages are regressed on worker attributes (age, sex, education, and seniority), a binary indicator for whether workers expect to be recalled, interaction terms between this indicator and seniority, a binary indicator capturing the end of temporary, term, or contract jobs, as well as transition-related variables. The results for 2008-to-2011 are shown in Table 11.[29] Text Table A5 presents the same analysis for the 2006-to-2008 period.

Table 11 generally reveals no robust association between worker attributes (including education) and wage changes; this is consistent with Table 9. Two exceptions are the fact that, all else equal, re-employed women experienced smaller wage losses than men[30] and that senior workers (with more than 20 years of job tenure) experienced larger wage losses than their counterparts with two years or less of seniority.

In contrast, transitions across job types account for part of the observed wage changes. For instance, workers who lost union coverage and workers who moved from a firm with 100 employees or more to a smaller firm experienced hourly-wage losses that were between 9-percentage-points and 13-percentage-points larger, and weekly-wage losses that were about 10-percentage-points larger, than those of workers who remained non-unionized and those of workers who remained employed in smaller firms. The substantial wage losses associated with loss of union coverage are in line with the results of Kuhn and Sweetman (1998).

The net result, conditioning on the average values of other covariates, is that expected declines in weekly wages were, at 11% to 14%, quite substantial for each of the following three groups: workers who lost union coverage; workers who moved from a firm with 100 employees or more to a smaller firm; and workers who changed industry and occupation (Table 12).[31] In contrast, the expected increases in weekly wages amounted to at least 4% for employees who gained union coverage or moved from firms employing fewer than 100 workers to firms with 100 or more employees.

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26. Percentage changes are obtained by taking the antilog of the numbers shown in Table 10, minus 1. Thus, hourly wage losses of 16% equal $e^{-0.18}-1$.
27. Together, these three groups account for 25% of re-employed laid-off workers in 2008-to-2011.
28. Together, these two groups account for 16.5% of re-employed laid-off workers in 2008-to-2011.
29. Changes in log weekly hours are also regressed on the aforementioned variables, as can be seen in the fifth column of Table 11. On average, workers who were laid-off during the most recent downturn and found a paid job shortly after being laid-off saw their average weekly work hours drop by 0.6 hours, from 34.5 before the layoffs to 33.9 after the layoffs. The corresponding decreases are -0.7 hours during the early 1980s and -1.2 hours during the early 1990s, respectively.
30. This gender difference does not hold for the weekly wage changes in the 2006-to-2008 multivariate analysis (see Text Table A5).
31. The percentage decline in wages is obtained by taking the antilog of the numbers shown in the first two columns of Table 12, minus 1. The large wage losses resulting from transitions across industries and occupations likely reflect the loss of a combination of skills: firm-specific skills, industry-specific skills (Neal 1995), and occupation-specific skills (Poletaev and Robinson 2008).

7 Conclusion

Over the last three decades, Canada has experienced three recessions. As a result of these, unemployment rates rose sharply in 1981-to-1983, 1990-to-1992, and, most recently, after October 2008. To shed light on the labour market implications of these slowdowns, this study attempts to answer four key questions:

1. Which workers were laid-off during these downturns?
2. How did layoff rates vary across downturns?
3. How did chances of finding employment shortly after being laid-off evolve across downturns?
4. Among workers who managed to find paid employment shortly after being laid-off, how do wages before and after layoffs compare?

The findings of this study are the following:

1. Compared with their counterparts who were permanently or temporarily laid-off during the early 1980s or early 1990s, Canadian workers laid-off during the most recent recession had greater seniority, were older, were better educated, and were less likely to come from the manufacturing sector. Except for seniority, these temporal changes in the profile of laid-off workers resulted mainly from compositional effects, i.e., changes in the age/education profile of the Canadian workforce as well as the secular decline of the manufacturing sector.
2. Assessed on a monthly basis, the risk of layoff during the most recent recession was, at 2.0%, lower than the rates of 2.9% and 2.7% observed during the early 1980s and the early 1990s, respectively.
3. Of all workers laid-off in 2008-to-2011, half of them found a paid job between one and four months after being displaced. This number is significantly higher than the corresponding proportion of 42% observed during the previous two recessions.
4. On average, employees who were laid-off during the most recent recession and who found a job shortly after being laid-off experienced a slight drop in employment income. However, one-quarter saw their weekly wages drop by 23% or more while another one-quarter saw increases in weekly pay of at least 18%. Average declines in weekly wages amounted to at least 10% for re-employed workers who lost union coverage, moved from a firm with at least 100 employees to a smaller firm, or changed both industry and occupation in the new job. Collectively, these groups represented about one-quarter of laid-off workers who were re-employed during the most recent recession. In contrast, employees who gained union coverage or moved from firms with fewer than 100 employees to firms with 100 or more employees registered average gains in weekly wages that amounted to between 8% and 11%. Collectively, these groups represented about 17% of laid-off workers who were re-employed during the most recent recession.

Consistent with Farber (2005) and Riddell and Song (2009), the study showed that having a university degree was generally associated with a greater likelihood of being employed shortly after being laid-off. However, conditional on being re-employed shortly after the layoff, holding a university degree was not associated with smaller wage losses.

Workers laid-off in 2006-to-2008 and 2008-to-2011 experienced very similar changes in (hourly and weekly) wages. Thus, conditional on their being re-employed in the short term, the impact of layoffs on pay changes did not differ much across these two adjacent periods.

While the study documented short-term wage changes for the one-half of laid-off workers who found a paid job in the first few months after being laid-off during the most recent downturn, it neither distinguished temporary layoffs from permanent layoffs nor assessed the long-term

wage impact of permanent layoffs. Recent research has found that high-seniority workers involved in mass layoffs experience substantial earnings losses for five years after losing their jobs (Jacobson, Lalonde, and Sullivan 1993; Couch and Placzek 2010; Morissette, Zhang, and Frenette 2007). Since a fairly high proportion (28%) of workers laid-off (temporarily or permanently) during the most recent recession had more than five years of seniority, whether this will be the case for those permanently laid-off during the employment downturn that started in October 2008 is an important question for future research.

Table 1
Characteristics of workers laid-off during the last three recessions (1981 to 1984, 1990 to 1994, 2008 to 2011)

Variables	1981 to 1984	1990 to 1994	2008 to 2011
		percent	
Gender			
Male	59.3	57.2	59.6
Female	40.7	42.8	40.4
Age group			
15 to 24 years	34.9	22.0	18.8
25 to 34 years	28.5	31.2	22.2
35 to 44 years	17.7	24.4	20.6
45 to 54 years	12.1	14.6	23.1
55 to 64 years	6.9	7.9	15.4
Education attainment			
Below university	94.6	92.5	84.3
University	5.4	7.5	15.7
Job tenure			
24 months or less	70.7	70.1	54.8
25 months to 60 months	13.7	13.1	17.2
61 months to 120 months	8.1	7.8	12.2
121 months to 240 months	5.5	6.5	9.7
241 months or more	1.9	2.4	6.1
Region			
Atlantic Provinces	12.3	14.2	11.3
Quebec	29.0	30.3	25.4
Ontario	30.7	30.1	35.5
Prairie Provinces	6.0	5.7	5.4
Alberta	8.5	7.9	10.3
British Columbia	13.4	11.7	12.1
Industry			
Primary industries and construction	23.5	23.9	22.8
Manufacturing	22.7	18.6	15.1
Retail trade, accommodation, and food services	15.9	15.9	14.1
High-skill services	8.8	10.8	14.2
Public services	15.7	17.3	19.5
Other service-producing industries	13.4	13.5	14.3
Occupation			
Managers	..	2.8	2.7
Professionals	..	7.5	11.5
Semi-professionals and technicians	..	5.1	7.1
Clerical, sales, and service personnel	..	36.2	34.0
Manual workers and trades personnel	..	48.3	44.7

Source: Statistics Canada, Labour Force Survey.

Table 2
Decomposition of changes in characteristics of laid-off workers (1981 to 1984, 2008 to 2011)

Variables	Share of layoffs, 1981 to 1984 (column 1)	Share of layoffs, 2008 to 2011 (column 2)	Actual change, (column 2 minus column 1) (column 3)	Predicted change, holding 1981-to-1984 share constant (column 4)
	percent		percentage points	
Gender				
Male	59.28	59.64	0.37	6.56
Female	40.72	40.36	-0.37	-6.56
Age group				
15 to 24 years	34.89	18.79	-16.10	-0.83
25 to 34 years	28.46	22.16	-6.30	-2.07
35 to 44 years	17.74	20.56	2.82	-0.22
45 to 54 years	12.05	23.05	11.00	0.26
55 to 64 years	6.86	15.44	8.58	2.86
Education attainment				
Below university	94.65	84.34	-10.31	-2.11
University	5.35	15.66	10.31	2.11
Job tenure				
24 months or less	70.73	54.80	-15.93	-11.69
25 months to 60 months	13.74	17.16	3.43	2.18
61 months to 120 months	8.14	12.25	4.11	4.17
121 months to 240 months	5.46	9.71	4.25	3.75
241 months or more	1.94	6.08	4.14	1.58
Region				
Atlantic Provinces	12.32	11.34	-0.98	-0.15
Quebec	29.03	25.38	-3.65	-1.97
Ontario	30.75	35.50	4.75	4.93
Prairie Provinces	6.00	5.41	-0.59	-0.12
Alberta	8.55	10.26	1.71	0.04
British Columbia	13.35	12.12	-1.23	-2.72
Industry				
Primary industries and construction	23.55	22.84	-0.70	-0.49
Manufacturing	22.72	15.09	-7.64	0.30
Retail trade, accommodation, and food services	15.85	14.07	-1.78	-2.71
High-skill services	8.75	14.18	5.43	2.03
Public services	15.68	19.54	3.86	0.97
Other service-producing industries	13.44	14.28	0.84	-0.11

Source: Statistics Canada, Labour Force Survey.

Table 3
Layoff rates in the last three recessions, by worker characteristics (1981 to 1984, 1990 to 1994, 2008 to 2011)

	1981 to 1984	1990 to 1994	2008 to 2011
		percent	
Overall rate	2.94	2.66	1.95
Gender			
Male	3.07	2.89	2.32
Female	2.77	2.40	1.58
Age group			
15 to 24 years	4.82	4.36	3.40
25 to 34 years	2.71	2.65	1.82
35 to 44 years	2.31	2.24	1.65
45 to 54 years	2.26	2.09	1.67
55 to 64 years	2.09	2.63	2.15
Education attainment			
Below university	3.20	2.94	2.22
University	1.19	1.21	1.18
Job tenure			
24 months or less	6.09	5.84	3.59
25 months to 60 months	1.89	1.62	1.54
61 months to 120 months	1.23	1.24	1.31
121 months to 240 months	0.94	0.86	1.12
241 months or more	0.70	0.66	0.90
Region			
Atlantic Provinces	4.88	5.06	3.23
Quebec	3.37	3.27	2.10
Ontario	2.32	2.04	1.80
Prairie Provinces	2.42	2.22	1.59
Alberta	2.52	2.19	1.70
British Columbia	3.52	2.52	1.88
Industry			
Primary industries and construction	6.50	6.57	4.40
Manufacturing	3.32	2.87	2.33
Retail trade, accommodation, and food services	2.91	2.57	1.67
High-skill services	1.76	1.80	1.50
Public services	1.87	1.68	1.37
Other service-producing industries	2.83	2.65	1.94
Occupation			
Managers	..	0.91	0.69
Professionals	..	1.29	1.20
Semi-professionals and technicians	..	1.89	1.54
Clerical, sales, and service personnel	..	2.26	1.58
Manual workers and trades personnel	..	4.85	3.87

Source: Statistics Canada, Labour Force Survey.

Table 4
Marginal effects of the determinants of the probability of being laid-off during the last three recessions (1981 to 1984, 1990 to 1994, 2008 to 2011)

Variables	1981 to 1984		1990 to 1994		2008 to 2011	
	marginal effect	standard error	marginal effect	standard error	marginal effect	standard error
Female	0.0010	0.0002 ***	0.0010	0.0002 *	-0.0020	0.0003 ***
Age/10	-0.0110	0.0010 ***	-0.0100	0.0010 ***	-0.0160	0.0010 ***
Age squared/100	0.0010	0.0001 ***	0.0020	0.0001 ***	0.0020	0.0001 ***
Education attainment (reference: below university)						
University	-0.0200	0.0010 ***	-0.0170	0.0010 ***	-0.0090	0.0004 ***
Job tenure (reference: 24 months or less)						
25 months to 60 months	-0.0330	0.0010 ***	-0.0360	0.0010 ***	-0.0180	0.0010 ***
More than 60 months	-0.0640	0.0010 ***	-0.0680	0.0010 ***	-0.0300	0.0010 ***
Region (reference: Ontario)						
Atlantic Provinces	0.0150	0.0004 ***	0.0190	0.0010 ***	0.0100	0.0004 ***
Quebec	0.0100	0.0004 ***	0.0110	0.0004 ***	0.0020	0.0004 *
Prairie Provinces	-0.0010	0.0004 ***	0.0003	0.0003	-0.0050	0.0004 ***
Alberta	-0.0040	0.0005 ***	-0.0030	0.0004 ***	-0.0060	0.0010 ***
British Columbia	0.0080	0.0004 ***	0.0010	0.0004 ***	-0.0010	0.0005
Industry before displacement (reference: primary industry and construction)						
Manufacturing	-0.0210	0.0010 ***	-0.0290	0.0010 ***	-0.0170	0.0010 ***
Retail trade, accommodation, and food services	-0.0450	0.0010 ***	-0.0530	0.0010 ***	-0.0390	0.0010 ***
High-skill services	-0.0590	0.0010 ***	-0.0580	0.0010 ***	-0.0340	0.0010 ***
Public services	-0.0420	0.0010 ***	-0.0480	0.0010 ***	-0.0300	0.0010 ***
Other service-producing industries	-0.0360	0.0010 ***	-0.0420	0.0010 ***	-0.0270	0.0010 ***

* p<0.05
** p<0.10
*** p<0.01

Notes: Marginal effects of the logit estimates on the probability of being laid-off are presented. The estimating equation regresses the binary dependent variable of whether a worker with a paid job in month *t-1* was laid-off in month *t* on workers' demographics, education attainment, job tenure, region, and industry. Sample weights are used to provide estimates for the entire population. Standard errors account for complex survey design (stratification, clustering, and non-response).

Source: Statistics Canada, Labour Force Survey.

Table 5
Incidence of re-employment across recessions, by worker characteristics (1981 to 1985, 1990 to 1995, 2008 to 2011)

	1981 to 1985	1990 to 1995	2008 to 2011
		percent	
Overall rate	41.6	41.9	50.3
Gender			
Male	41.7	39.5	47.4
Female	41.4	44.9	54.0
Age group			
15 to 24 years	38.8	39.4	53.5
25 to 34 years	41.4	43.4	52.6
35 to 44 years	45.2	42.7	51.6
45 to 54 years	42.7	43.0	49.0
55 to 64 years	39.7	36.8	46.0
Education			
Below university	41.2	41.1	48.2
University	47.5	51.2	59.8
Region			
Atlantic Provinces	31.8	33.5	43.9
Quebec	37.1	39.5	49.7
Ontario	46.3	43.6	50.7
Prairie Provinces	41.6	43.3	62.6
Alberta	47.1	46.4	51.3
British Columbia	45.6	51.2	49.9
Job tenure			
24 months or less	37.0	38.0	44.1
25 months to 60 months	43.4	44.8	47.7
61 months to 120 months	50.9	45.8	50.3
121 months to 240 months	54.6	52.5	54.3
241 months or more	53.8	53.7	47.6
Industry before displacement			
Primary industries and construction	39.1	37.3	44.8
Manufacturing	44.4	43.0	46.9
Retail trade, accommodation, and food services	37.2	35.9	43.9
High-skill services	40.4	38.3	44.5
Public services	46.4	55.3	66.2
Other service-producing industries	40.8	39.4	46.5
Occupation before displacement			
Managers	..	34.8	42.7
Professionals	..	54.4	63.4
Semi-professionals and technicians	..	48.9	51.9
Clerical, sales, and service personnel	..	40.6	47.7
Manual workers and trades personnel	..	40.5	48.2

Please see source at end of table.

Table 5 (concluded)
Incidence of re-employment across recessions, by worker characteristics (1981 to 1985, 1990 to 1995, 2008 to 2011)

	1981 to 1985	1990 to 1995	2008 to 2011
		percent	
Expected to be recalled at layoff			
No	35.6	36.1	47.7
Yes	61.8	64.0	61.1
In contract work before displacement			
No	..	..	49.6
Yes	..	..	54.2
Unionized before displacement			
No	..	..	45.0
Yes	..	..	60.4
Firm size			
Fewer than 20 employees	..	..	44.0
20 to 99 employees	..	..	45.7
100 to 500 employees	..	..	49.9
Over 500 employees	..	..	56.9

Source: Statistics Canada, Labour Force Survey.

Table 6
Linear probability model estimates of the determinants of being re-employed (1981 to 1985, 1990 to 1995, 2008 to 2011)

	1981 to 1985		1990 to 1995		2008 to 2011	
	coefficient	standard error	coefficient	standard error	coefficient	standard error
Variables						
Female	-0.0180	0.0100 **	0.0250	0.0090 ***	0.0130	0.0150
Age/10	0.0520	0.0230 *	0.0340	0.0210	-0.0350	0.0360
Age squared/100	-0.0090	0.0030 ***	-0.0070	0.0030 ***	0.0000	0.0040
Education attainment (reference: below university)						
University	0.0520	0.0220 *	0.0520	0.0170 ***	0.0520	0.0180 ***
Job tenure (reference: 24 months or less)						
25 months to 60 months	0.0360	0.0130 ***	0.0400	0.0120 ***	0.0260	0.0200
More than 60 months	0.0920	0.0140 ***	0.0640	0.0110 ***	0.0770	0.0170 ***
Expected to be recalled at layoff	0.2170	0.0160 ***	0.2420	0.0140 ***	0.1450	0.0240 ***
Tenure group × expected to be recalled						
25 months to 60 months	0.0040	0.0290	0.0230	0.0260	0.0440	0.0430
More than 60 months	0.0670	0.0250 ***	0.0550	0.0220 *	0.0340	0.0340
Region (reference: Ontario)						
Atlantic Provinces	-0.0980	0.0120 ***	-0.0400	0.0100 ***	-0.0430	0.0160 ***
Quebec	-0.0590	0.0120 ***	0.0060	0.0110	-0.0030	0.0190
Prairie Provinces	-0.0130	0.0140	0.0290	0.0130 *	0.0890	0.0180 ***
Alberta	0.0460	0.0190 *	0.0630	0.0140 ***	0.0330	0.0210
British Columbia	0.0090	0.0150	0.1120	0.0150 ***	-0.0140	0.0210
Industry (reference: primary industries and construction)						
Manufacturing	0.0190	0.0130	0.0420	0.0120 ***	0.0040	0.0220
Retail trade, accommodation, and food services	0.0270	0.0150 **	0.0030	0.0130	0.0100	0.0240
High-skill services	0.0380	0.0180 *	0.0110	0.0160	0.0130	0.0250
Public services	0.1000	0.0150 ***	0.1700	0.0130 ***	0.2190	0.0220 ***
Other service-producing industries	0.0370	0.0160 *	0.0300	0.0130 *	0.0480	0.0220 *
Month of the first layoff (reference: month 2)						
Month 3	-0.0310	0.0110 ***	-0.0330	0.0100 ***	0.0090	0.0170
Month 4	-0.0790	0.0130 ***	-0.0670	0.0110 ***	-0.0780	0.0180 ***
Month 5	-0.1900	0.0120 ***	-0.1770	0.0100 ***	-0.2120	0.0180 ***
Constant	0.3310	0.0420 ***	0.3050	0.0410 ***	0.5690	0.0720 ***

	1981 to 1985	1990 to 1995	2008 to 2011
Diagnostic statistics			
Number of observations	22,152	34,926	9,961
R-squared	0.089	0.102	0.091

* p<0.05
** p<0.10
*** p<0.01

Notes: A linear probability model is used. The estimating equation regresses the binary dependent variable of whether the displaced workers were re-employed with a paid job at the last month of the Labour Force Survey interview on different sets of controls. Sample weights are used to provide estimates for the entire population. Standard errors account for complex survey design (stratification, clustering, and non-response).

Source: Statistics Canada, Labour Force Survey.

Table 7
Average wage changes among re-employed workers (2006 to 2008, 2008 to 2011)

	2006 to 2008			2008 to 2011		
	Before layoff (column 1)	After layoff (column 2)	Difference (column 2 minus column 1) (column 3)	Before layoff (column 4)	After layoff (column 5)	Difference (column 5 minus column 4) (column 6)
	2008 constant dollars					
Average hourly wage	19.7	19.3	-0.4	20.9	20.4	-0.5
Average weekly wage	694.5	662.1	-32.4	734.1	702.7	-31.4

Source: Statistics Canada, Labour Force Survey.

Table 8
Distributional statistics of percentage wage changes and log wage changes among re-employed workers (2006 to 2008, 2008 to 2011)

	Panel A				Panel B			
	Changes in hourly wages		Changes in weekly wages		Changes in log hourly wages		Chagnes in log weekly wages	
	2006 to 2008	2008 to 2011	2006 to 2008	2008 to 2011	2006 to 2008	2008 to 2011	2006 to 2008	2008 to 2011
	percent				change in log			
Mean	...	...	...	...	-0.02	-0.02	-0.06	-0.04
Median	0.00	0.00	-0.43	0.00	0.00	0.00	0.00	0.00
10th percentile	-36.87	-38.24	-54.27	-50.31	-0.46	-0.48	-0.78	-0.70
25th percentile	-13.14	-12.62	-23.52	-22.87	-0.14	-0.13	-0.27	-0.26
75th percentile	10.12	10.82	17.10	17.89	0.10	0.10	0.16	0.16
90th percentile	47.61	45.99	78.04	81.29	0.39	0.38	0.58	0.59

Note: Wages are computed in 2008 constant dollars.
Source: Statistics Canada, Labour Force Survey.

Table 9
Mean log wage changes pre-/post-displacement, by worker characteristics (2006 to 2008, 2008 to 2011)

	Hourly wages		Weekly wages	
	2006 to 2008	2008 to 2011	2006 to 2008	2008 to 2011
	mean change in log			
Overall change	-0.020	-0.020	-0.060	-0.040
Gender				
Male	-0.040	-0.050	-0.070	-0.070
Female	-0.004	-0.002	-0.050	-0.010
Age group				
15 to 24 years	-0.010	-0.020	-0.005	-0.040
25 to 34 years	-0.020	-0.030	-0.050	-0.030
35 to 44 years	-0.040	-0.040	-0.100	-0.090
45 to 54 years	-0.020	-0.010	-0.070	-0.010
55 to 64 years	0.010	-0.020	-0.040	-0.050
Education attainment				
Less than high school	0.002	-0.020	-0.030	-0.040
High school	0.004	-0.020	-0.010	-0.040
Postsecondary	-0.040	-0.020	-0.100	-0.040
University degree	-0.030	-0.030	-0.060	-0.040
Job tenure				
24 months or less	-0.005	-0.020	-0.050	-0.020
25 months to 60 months	-0.010	-0.040	-0.040	-0.060
61 months to 120 months	-0.030	0.010	-0.060	-0.060
121 months to 240 months	-0.060	-0.030	-0.100	-0.060
241 months or more	-0.070	-0.070	-0.140	-0.110
Region				
Atlantic Provinces	-0.030	-0.030	-0.040	-0.070
Quebec	-0.010	-0.020	-0.070	-0.010
Ontario	-0.020	-0.020	-0.070	-0.050
Prairie Provinces	-0.030	-0.030	-0.060	-0.060
Alberta	-0.050	-0.050	-0.020	-0.100
British Columbia	-0.040	-0.040	-0.070	-0.040
Industry before displacement				
Primary industries and construction	-0.070	-0.050	-0.110	-0.100
Manufacturing	-0.050	-0.030	-0.120	-0.050
Retail trade, accommodation, and food services	0.050	0.070	0.030	0.130
High-skill services	-0.030	-0.050	-0.080	-0.130
Public services	-0.010	-0.030	-0.030	-0.020
Other service-producing industries	0.030	-0.020	-0.040	-0.070
Occupation before displacement				
Managers	-0.110	-0.030	-0.210	-0.130
Professionals	-0.050	-0.050	-0.110	-0.070
Semi-professionals and technicians	-0.010	-0.030	-0.070	-0.060
Clerical, sales, and service personnel	0.020	0.003	0.010	0.010
Manual workers and trades personnel	-0.040	-0.030	-0.090	-0.060
Expected to be recalled at layoff				
No	-0.080	-0.030	-0.950	-0.040
Yes	0.010	-0.020	-0.020	-0.060

Please see source at end of table.

Table 9 (concluded)
Mean log wage changes pre-/post-displacement, by worker characteristics (2006 to 2008, 2008 to 2011)

	Hourly wages		Weekly wages	
	2006 to 2008	2008 to 2011	2006 to 2008	2008 to 2011
	mean change in log			
In contract work before displacement				
No	-0.020	-0.030	-0.060	-0.050
Yes	-0.050	-0.020	-0.100	-0.030
Unionized before displacement				
No	-0.010	-0.010	-0.050	-0.030
Yes	-0.040	-0.050	-0.080	-0.060
Firm size				
Fewer than 20 employees	-0.020	0.010	-0.050	-0.010
20 to 99 employees	-0.001	-0.010	-0.050	-0.030
100 to 500 employees	-0.020	-0.030	-0.070	-0.050
Over 500 employees	-0.030	-0.050	-0.070	-0.070

Source: Statistics Canada, Labour Force Survey.

Table 10
Mean log wage changes pre-/post-displacement, by job transition (2006 to 2008, 2008 to 2011)

	Hourly wages		Weekly wages	
	2006 to 2008	2008 to 2011	2006 to 2008	2008 to 2011
	mean change in log			
Overall change	-0.02	-0.02	-0.06	-0.04
Union status before and after displacement				
Unionized to unionized	-0.01	-0.02	-0.02	-0.03
Unionized to non-unionized	-0.20	-0.18	-0.30	-0.19
Non-unionized to non-unionized	-0.03	-0.02	-0.08	-0.05
Non-unionized to unionized	0.15	0.08	0.12	0.08
Firm size before and after displacement				
100 or more employees to 100 or more employees	-0.01	-0.02	-0.04	-0.03
100 or more employees to fewer than 100 employees	-0.09	-0.12	-0.15	-0.16
Fewer than 100 employees to fewer than 100 employees	-0.05	-0.13	-0.11	-0.17
Fewer than 100 employees to 100 employees or more	0.09	0.06	0.09	0.10
Industry and occupation before and after displacement				
Industry stayers and occupation stayers	-0.02	-0.02	-0.05	-0.04
Industry stayers and occupation changers	-0.02	-0.01	-0.01	-0.05
Industry changers and occupation stayers	-0.05	-0.04	-0.08	-0.04
Industry changers and occupation changers	-0.02	-0.06	-0.13	-0.10

Source: Statistics Canada, Labour Force Survey.

Table 11
Regression estimates of log wage changes and log hour changes with transitions (2008 to 2011)

	Log hourly-wage change		Log weekly-wage change		Log usual-hours-per-week change	
	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
	cofficient	standard error	cofficient	standard error	cofficient	standard error
Variables						
Female	0.052	0.015 ***	0.074	0.022 ***	0.021	0.018
Age/10	-0.052	0.034	-0.065	0.058	-0.013	0.045
Age squared/100	0.007	0.004	0.009	0.007	0.002	0.006
Education attainment (reference: less than high school)						
High school	-0.002	0.019	-0.014	0.032	-0.012	0.026
Postsecondary	-0.006	0.018	-0.010	0.029	-0.004	0.024
University degree	-0.027	0.025	-0.023	0.037	0.003	0.031
Job tenure (reference: 24 months or less)						
25 months to 60 months	-0.021	0.024	-0.053	0.038	-0.032	0.032
61 months to 120 months	0.027	0.023	-0.062	0.039	-0.089	0.034 ***
121 months to 240 months	-0.007	0.029	-0.065	0.039 **	-0.058	0.029 *
241 months or more	-0.058	0.034 **	-0.132	0.044 ***	-0.075	0.032 *
Expected to be recalled at layoff	0.026	0.023	-0.018	0.036	-0.044	0.029
Tenure group x expected to be recalled						
25 months to 60 months	0.025	0.035	0.058	0.054	0.033	0.044
61 months to 120 months	-0.026	0.039	0.022	0.058	0.048	0.045
121 months to 240 months	-0.023	0.041	0.011	0.057	0.034	0.043
241 months or more	-0.006	0.048	0.061	0.059	0.067	0.043
Contract work before displacement	0.010	0.022	0.008	0.034	-0.002	0.027
Union status transitions						
Unionized to unionized	0.004	0.016	0.011	0.024	0.007	0.019
Unionized to non-unionized	-0.130	0.034 ***	-0.109	0.054 *	0.021	0.048
Non-unionized to unionized	0.091	0.030 ***	0.097	0.046 *	0.007	0.035
Firm size transitions						
100 or more to 100 or more employees	0.005	0.016	0.033	0.027	0.028	0.021
100 or more to fewer than 100 employees	-0.086	0.023 ***	-0.090	0.038 *	-0.004	0.030
Fewer than 100 to 100 or more employees	0.075	0.025 ***	0.153	0.042 ***	0.078	0.035 *
Industry and occupation transitions						
Industry stayers and occupation changers	0.012	0.033	-0.026	0.060	-0.037	0.044
Industry changers and occupation stayers	0.000	0.023	0.000	0.041	0.001	0.032
Industry and occupation changers	-0.035	0.033	-0.072	0.052	-0.036	0.043
Constant	0.049	0.067	0.058	0.113	0.008	0.087

Please see notes and source at end of table.

Table 11 (concluded)
Regression estimates of log wage changes and log hour changes with transitions (2008 to 2011)

	Log hourly-wage change	Log weekly-wage change	Log usual-hours-per-week change
Diagnostic statistics			
Number of observations	5,041	5,041	5,041
R-squared	0.037	0.023	0.007

* p<0.05
** p<0.10
*** p<0.01

Notes: The estimating equation regresses the log hourly-wage changes (Column 1), log weekly-wage changes (Column 3), and log usual-work-hours-per-week changes (Column 5) before and after displacement on workers' demographics, education attainment, job tenure, indicator for expected to be recalled at layoff and interaction terms with tenure group, contract work indicator, union status transition, firm-size transition, and industry and occupation transition. Sample weights are used to provide estimates for the entire population. Standard errors account for complex survey design (stratification, clustering, and non-response).

Source: Statistics Canada, Labour Force Survey.

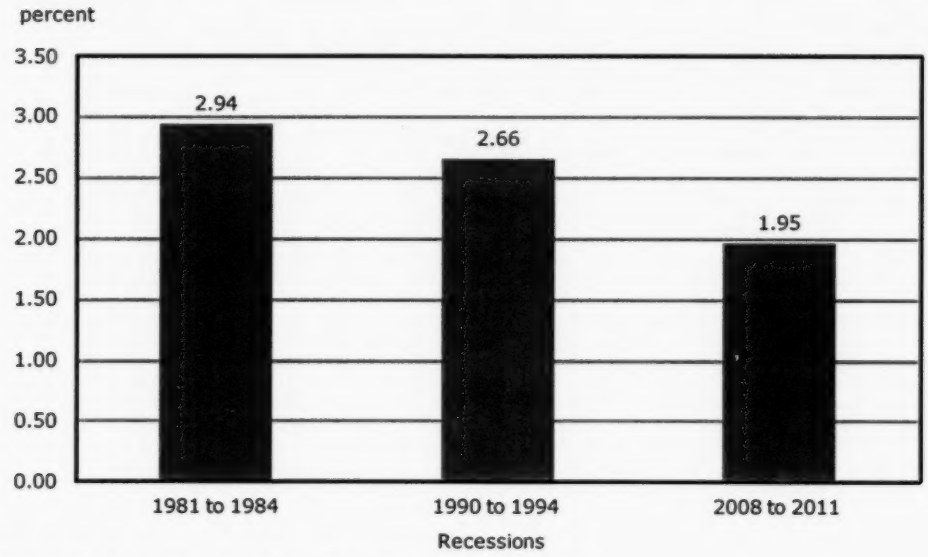
Table 12
Expected log wage changes (2008 to 2011)

Variables	Hourly wages	Weekly wages	Share of the re-employed
	expected change in log		percent
Lost union coverage	-0.15	-0.15	7.00
Gained union coverage	0.05	0.04	7.70
Changed from a firm with 100 employees or more to a firm with fewer than 100 employees	-0.11	-0.13	13.80
Changed from a firm with fewer than 100 employees to a firm with 100 or more employees	0.03	0.08	11.50
Industry stayers and occupation stayers	-0.03	-0.04	75.50
Industry stayers and occupation changers	-0.02	-0.08	4.80
Industry changers and occupation stayers	-0.03	-0.05	10.30
Industry and occupation changers	-0.06	-0.12	9.40

Note: The expected log wage changes are computed conditional on the average values of other control variables.

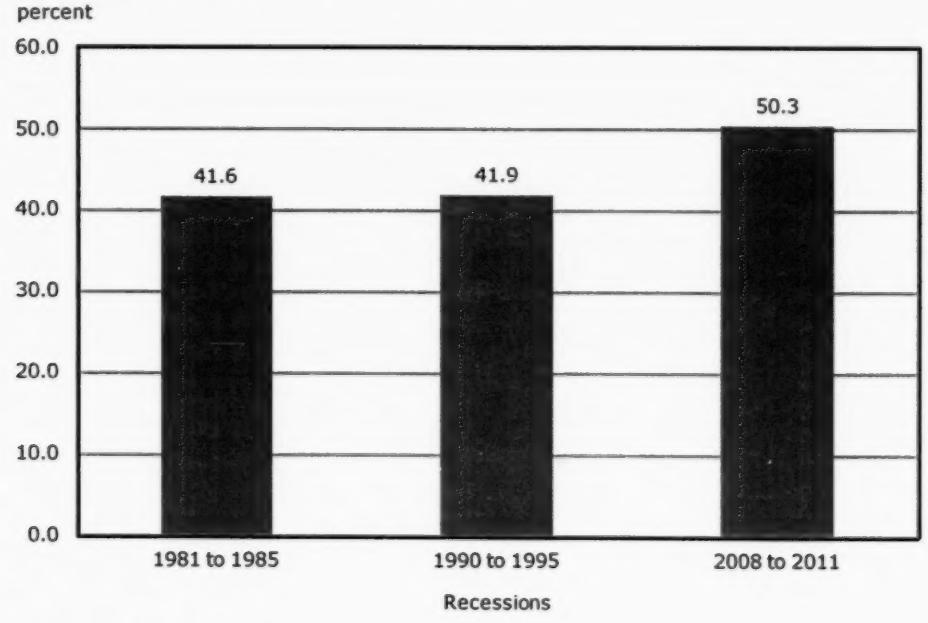
Source: Statistics Canada, Labour Force Survey.

Chart 1
Layoff rate in each recession



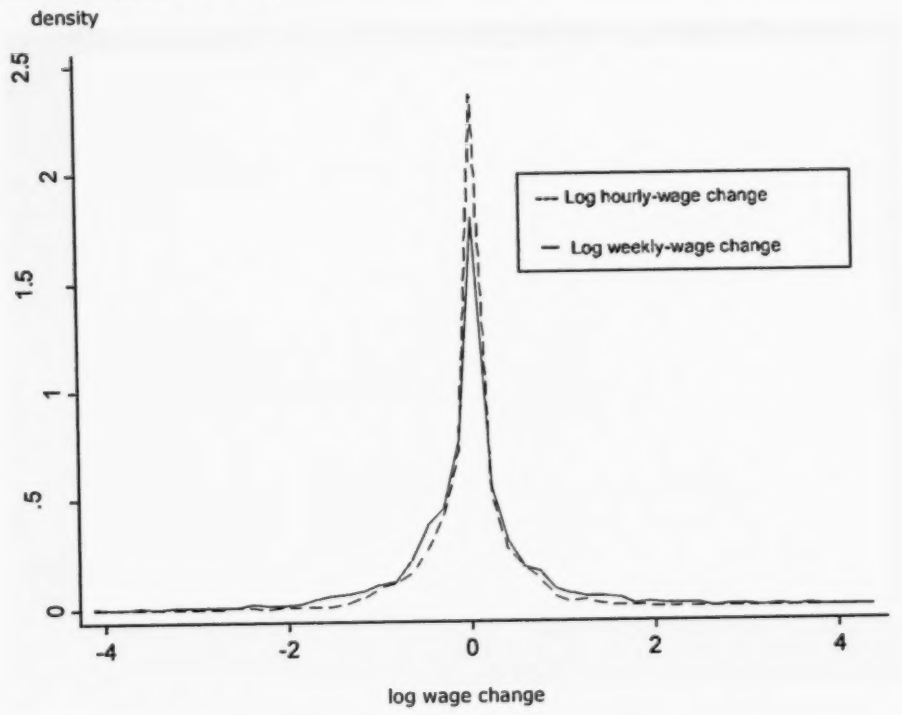
Note: Authors' calculations from Labour Force Survey, Statistics Canada.

Chart 2
Re-employment rate in each recession



Note: Authors' calculations from Labour Force Survey, Statistics Canada.

Figure 1
Kernel density of log hourly-wage change and log weekly-wage change (2008 to 2011)



Note: Log wage change pre-/post-displacement computed in 2008 constant dollars.
Source: Statistics Canada, Labour Force Survey.

Appendix A – Tables

Text table A1
Characteristics of laid-off workers, 1981-to-1984 to 2008-to-2011

Variables	1981 to 1984	1987 to 1988	1990 to 1994	1998 to 1999	2003 to 2004	2008 to 2011
			percent			
Gender						
Male	59.3	54.8	57.2	56.4	55.7	59.6
Female	40.7	45.2	42.8	43.6	44.3	40.4
Age group						
15 to 24 years	34.9	27.2	22.0	19.7	19.8	18.8
25 to 34 years	28.5	31.6	31.2	24.3	22.6	22.2
35 to 44 years	17.7	21.3	24.4	27.3	24.2	20.6
45 to 54 years	12.1	12.8	14.7	19.6	20.8	23.1
55 to 64 years	6.9	7.2	7.9	9.0	12.5	15.4
Education attainment						
Below university	94.7	92.7	92.5	89.0	86.0	84.3
University	5.4	7.3	7.5	11.0	14.0	15.7
Job tenure						
24 months or less	70.7	76.9	70.1	66.6	57.1	54.8
25 months to 60 months	13.7	9.9	13.1	13.6	17.9	17.2
61 months to 120 months	8.1	6.7	7.8	8.4	10.9	12.2
121 months to 240 months	5.5	4.8	6.5	8.2	9.1	9.7
241 months or more	1.9	1.7	2.4	3.3	5.0	6.1
Region						
Atlantic Provinces	12.3	15.2	14.2	15.0	13.9	11.3
Quebec	29.0	31.4	30.3	28.9	26.8	25.4
Ontario	30.8	25.2	30.1	27.0	30.9	35.5
Prairie Provinces	6.0	7.0	5.8	5.9	5.6	5.4
Alberta	8.6	8.7	7.9	9.9	9.3	10.3
British Columbia	13.4	12.5	11.7	13.4	13.6	12.1
Industry before displacement						
Primary industries and construction	23.6	23.8	23.9	23.1	21.2	22.8
Manufacturing	22.7	18.4	18.6	16.9	16.7	15.1
Retail trade, accommodation, and food services	15.9	15.9	15.9	15.4	12.9	14.1
High-skill services	8.8	10.2	10.8	13.0	14.2	14.2
Public services	15.9	18.1	17.3	17.0	21.6	19.5
Other service-producing industries	13.4	13.6	13.5	14.7	13.6	14.3
Occupation before displacement						
Managers	..	2.2	2.8	2.7	2.4	2.7
Professionals	..	7.3	7.5	8.6	11.6	11.5
Semi-professionals and technicians	..	5.4	5.1	6.1	7.2	7.1
Clerical, sales, and service personnel	..	36.9	36.2	35.9	34.1	34.0
Manual workers and trades personnel	..	48.2	48.3	46.6	44.6	44.7

Source: Statistics Canada, Labour Force Survey.

Text table A2
Profile of paid workers across the three recessions (1981 to 1984, 1990 to 1994, 2008 to 2011)

Variables	1981 to 1984	1990 to 1994	2008 to 2011
		percent	
Gender			
Male	56.8	52.7	50.2
Female	43.2	47.3	49.8
Age group			
15 to 24 years	21.3	13.4	10.8
25 to 34 years	30.9	31.2	23.8
35 to 44 years	22.6	28.9	24.3
45 to 54 years	15.7	18.6	27.0
55 to 64 years	9.6	7.9	14.1
Education attainment			
Below university	86.8	83.5	74.1
University	13.2	16.5	25.9
Job tenure			
24 months or less	34.1	31.9	29.9
25 months to 60 months	21.4	21.4	21.8
61 months to 120 months	19.4	16.8	18.2
121 months to 240 months	17.0	20.1	16.9
241 months or more	8.1	9.7	13.2
Region			
Atlantic Provinces	7.4	7.5	6.9
Quebec	25.3	24.6	23.6
Ontario	38.9	39.2	38.5
Prairie Provinces	7.3	6.9	6.7
Alberta	10.0	9.6	11.8
British Columbia	11.1	12.3	12.6
Industry			
Primary industries and construction	10.6	9.7	10.1
Manufacturing	20.1	17.2	12.7
Retail trade, accommodation, and food services	16.0	16.4	16.5
High-skill services	14.6	16.0	18.5
Public services	24.6	27.3	27.8
Other service-producing industries	14.0	13.5	14.4
Occupation			
Managers	..	8.3	7.7
Professionals	..	15.4	18.7
Semi-professionals and technicians	..	7.2	9.0
Clerical, sales, and service personnel	..	42.6	42.0
Manual workers and trades personnel	..	26.5	22.6

Source: Statistics Canada, Labour Force Survey.

Text table A3
Relative risk of being laid-off, by characteristics (1981 to 1984, 1990 to 1994, 2008 to 2011)

	1981 to 1984	1990 to 1994	2008 to 2011
	percent		
Overall risk	2.94	2.66	1.95
Gender			
Male	1.04	1.09	1.19
Female	0.94	0.90	0.81
Age group			
15 to 24 years	1.64	1.64	1.74
25 to 34 years	0.92	1.00	0.93
35 to 44 years	0.79	0.84	0.84
45 to 54 years	0.77	0.79	0.85
55 to 64 years	0.71	0.99	1.10
Education attainment			
Below university	1.09	1.11	1.14
University	0.41	0.46	0.60
Job tenure			
24 months or less	2.07	2.20	1.83
25 months to 60 months	0.64	0.61	0.79
61 months to 120 months	0.42	0.47	0.67
121 months to 240 months	0.32	0.32	0.57
241 months or more	0.24	0.25	0.46
Province			
Atlantic Provinces	1.66	1.91	1.65
Quebec	1.15	1.23	1.08
Ontario	0.79	0.77	0.92
Prairie Provinces	0.82	0.84	0.81
Alberta	0.86	0.82	0.87
British Columbia	1.20	0.95	0.96
Industry			
Primary industries and construction	2.21	2.47	2.25
Manufacturing	1.13	1.08	1.19
Retail trade, accommodation, and food services	0.99	0.97	0.85
High-skill services	0.60	0.68	0.77
Public services	0.64	0.63	0.70
Other service-producing industries	0.96	1.00	0.99
Occupation			
Managers	..	0.34	0.36
Professionals	..	0.48	0.61
Semi-professionals and technicians	..	0.71	0.79
Clerical, sales, and service personnel	..	0.85	0.81
Manual workers and trades personnel	..	1.83	1.98

Source: Statistics Canada, Labour Force Survey.

Text table A4
Decomposition of changes in characteristics of laid-off workers (1990 to 1994, 2008 to 2011)

Variables	Share of layoffs, 1990 to 1994 (column 1)	Share of layoffs, 2008 to 2011 (column 2)	Actual change (column 2 minus column 1) (column 3)	Predicted change, holding 1990-to-1994 share constant (column 4)
	percent		percentage points	
Gender				
Male	57.23	59.64	2.41	4.77
Female	42.77	40.36	-2.41	-4.77
Age group				
15 to 24 years	21.95	18.79	-3.16	1.01
25 to 34 years	31.16	22.16	-9.00	-2.52
35 to 44 years	24.37	20.56	-3.82	-0.27
45 to 54 years	14.65	23.05	8.40	1.05
55 to 64 years	7.86	15.44	7.58	0.74
Education attainment				
Below university	92.47	84.34	-8.13	-1.99
University	7.53	15.66	8.13	1.99
Job tenure				
24 months or less	70.14	54.80	-15.34	-13.15
25 months to 60 months	13.10	17.16	4.06	3.32
61 months to 120 months	7.82	12.25	4.43	3.18
121 months to 240 months	6.52	9.71	3.19	4.73
241 months or more	2.42	6.08	3.66	1.93
Region				
Atlantic Provinces	14.21	11.34	-2.87	-1.99
Quebec	30.27	25.38	-4.89	-4.01
Ontario	30.14	35.50	5.35	5.77
Prairie Provinces	5.75	5.41	-0.34	-0.20
Alberta	7.90	10.26	2.35	0.37
British Columbia	11.72	12.12	0.40	0.07
Industry				
Primary industries and construction	23.94	22.84	-1.10	-2.38
Manufacturing	18.57	15.09	-3.48	1.64
Retail trade, accommodation, and food services	15.87	14.07	-1.80	-2.00
High-skill services	10.83	14.18	3.35	1.25
Public services	17.30	19.54	2.25	1.67
Other service-producing industries	13.50	14.28	0.78	-0.16

Source: Statistics Canada, Labour Force Survey.

Text table A5
Regression estimates of log wage changes and log hour changes with transitions (2006 to 2008)

	Log hourly-wage change		Log weekly-wage change		Log usual-hours-per-week change	
	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
	coefficient	standard error	coefficient	standard error	coefficient	standard error
Variables						
Female	0.038	0.016 *	0.021	0.025	-0.016	0.020
Age/10	-0.081	0.041 *	-0.136	0.061 *	-0.054	0.051
Age squared/100	0.012	0.005 *	0.017	0.007 *	0.005	0.006
Education attainment (reference: less than high school)						
High school	-0.003	0.021	0.020	0.034	0.023	0.027
Postsecondary	-0.049	0.020 *	-0.080	0.032 *	-0.030	0.025
University degree	-0.055	0.029 **	-0.051	0.044	0.004	0.034
Job tenure (reference: 24 months or less)						
25 months to 60 months	-0.039	0.023 **	-0.010	0.041	0.029	0.034
61 months to 120 months	-0.055	0.032 **	-0.041	0.042	0.014	0.032
121 months to 240 months	-0.087	0.029 ***	-0.080	0.041 *	0.007	0.032
241 months or more	-0.099	0.039 *	-0.142	0.047 ***	-0.042	0.046
Expected to be recalled at layoff	0.016	0.027	0.047	0.039	0.031	0.029
Expected to be recalled x tenure group						
25 months to 60 months	0.084	0.047 **	0.021	0.083	-0.063	0.065
61 months to 120 months	0.060	0.049	0.025	0.068	-0.036	0.051
121 months to 240 months	0.011	0.043	-0.010	0.058	-0.020	0.044
241 months or more	-0.044	0.055	-0.019	0.063	0.026	0.053
Contract work before displacement	-0.032	0.026	-0.045	0.040	-0.013	0.031
Union status transitions						
Unionized to unionized	0.044	0.020 *	0.072	0.027 ***	0.028	0.022
Unionized to non-unionized	-0.136	0.033 ***	-0.176	0.049 ***	-0.040	0.040
Non-unionized to unionized	0.168	0.036 ***	0.177	0.051 ***	0.009	0.042
Firm size transitions						
100 or more to 100 or more employees	0.035	0.019 **	0.053	0.029 **	0.018	0.024
100 or more to fewer than 100 employees	-0.010	0.025	-0.003	0.040	0.007	0.031
Fewer than 100 to 100 or more employees	0.123	0.031 ***	0.195	0.043 ***	0.071	0.032 *
Industry and occupation transitions						
Industry stayers and occupation changers	0.012	0.041	0.047	0.067	0.035	0.050
Industry changers and occupation stayers	-0.037	0.023	-0.044	0.044	-0.007	0.038
Industry and occupation changers	0.010	0.033	-0.069	0.053	-0.079	0.045 **
Constant	0.115	0.076	0.197	0.122	0.082	0.103

	Log hourly-wage change	Log weekly-wage change	Log usual-hours-per-week change
Diagnostic statistics			
Number of observations	4,545	4,545	4,545
R-squared	0.059	0.040	0.011

* p<0.05
** p<0.10
*** p<0.01

Notes: The estimating equation regresses the log hourly-wage changes (Column 1), log weekly-wage changes (Column 3), and log usual-work-hours-per-week changes (Column 5) before and after displacement on workers' demographics, education attainment, job tenure, indicator for expected to be recalled at layoff and interaction terms with tenure group, contract work indicator, union status transition, firm-size transition, and industry and occupation transition. Sample weights are used to provide estimates for the entire population. Standard errors account for complex survey design (stratification, clustering, and non-response).

Source: Statistics Canada, Labour Force Survey.

Appendix B

Identification of laid-off workers in the Labour Force Survey data

With the Labour Force Survey (LFS) Tabulations (TABS) files, individuals are selected if they: 1) are aged between 15 and 64; 2) are not a full-time student; and 3) worked in a paid job in month *t-1*, the month preceding the layoff. Among these, workers are counted as being laid-off in month *t* if the *WHYLEFT2* variable indicates a layoff (i.e., if *WHYLEFT2* variable equals to 4). This variable indicates a response of "lost job or laid-off" to the question "What was the main reason ... stopped working at that job?" This question is asked when individuals are not currently working but have worked in the preceding 12 months.

Further to the 1997 LFS redesign, an additional question, "Can you be more specific about the main reason for ...'s job loss?," was added to probe the specific nature of involuntary job loss. The expanded response categories are captured in the *WHYLEFT* variable, which allows identification of those who lost their jobs for any of the following reasons: they were seasonal, temporary, or contract workers; they were casual employees; the company moved or went out of business; poor business conditions or temporary closure; dismissal; or other reasons. However, since the current analysis spans pre- and post-1997, the *WHYLEFT2* variable is used instead of *WHYLEFT* to identify layoffs.

To calculate layoff rates, monthly transitions from paid employment to non-employment due to layoffs are captured. For each pair of months selected, inflows into layoffs between month *t-1* and month *t* are divided by the number of workers in paid employment in month *t-1*. Suppose: a) there are *X* paid workers in month *t-1*; and b) *Y* workers are laid-off between month *t-1* and month *t*. Then the layoff rate for the pair of months *t-1* and *t* is *Y/X*. Averaging this layoff rate across all pairs of months observed during a downturn yields the downturn-specific layoff rate (e.g., 1.95% for all pair of months starting in October–November 2008 and ending in December 2010–January 2011).

Using this approach, one can follow 12 month-to-month transitions in a given year by means of the LFS data to derive a yearly count of layoffs. This annual measure can then be compared with the annual counts from the Longitudinal Worker File (LWF). Text Table B1 shows the yearly counts from the two files from 1978 onwards. Columns 1 and 2 present the yearly layoff count for both permanent and temporary layoffs. Column 3 presents the estimated number of permanent layoffs from the LWF.

Text table B1
Annual number of layoffs, 1978-to-2010
(workers aged 15 to 64)

Years	Permanent and temporary layoffs		Permanent layoffs
	LFS (column 1)	LWF (column 2)	LWF (column 3)
	number		
1978	1,967,553	2,169,764	981,048
1979	1,945,441	2,028,592	874,094
1980	2,136,226	2,119,579	837,193
1981	2,384,590	2,499,388	982,256
1982	3,135,318	3,167,884	1,137,184
1983	2,501,212	2,611,499	1,005,142
1984	2,716,199	2,628,629	1,017,196
1985	2,660,106	2,546,327	999,877
1986	2,323,162	2,565,270	992,845
1987	2,508,988	2,537,899	992,693
1988	2,432,771	2,522,363	1,014,546
1989	2,396,970	2,537,271	995,184
1990	2,753,198	2,941,442	1,174,162
1991	3,043,410	3,018,039	1,114,212
1992	3,019,342	2,938,564	1,056,786
1993	2,932,744	2,753,851	1,006,860
1994	2,635,898	2,606,434	976,852
1995	2,859,265	2,724,770	984,309
1996	2,816,018	2,753,225	973,505
1997	2,459,913	2,793,294	1,039,351
1998	2,491,197	2,888,619	1,039,744
1999	2,377,749	2,744,547	991,496
2000	2,236,122	2,741,824	979,546
2001	2,456,988	2,973,880	1,044,135
2002	2,515,406	2,753,674	950,819
2003	2,527,433	2,853,093	976,137
2004	2,482,113	2,732,045	925,329
2005	2,372,591	2,693,729	894,671
2006	2,397,340	2,755,095	894,083
2007	2,433,808	2,712,075	884,217
2008	2,688,040	...	...
2009	2,983,028	...	...
2010	2,586,936	...	...

Sources: Statistics Canada, Labour Force Survey (LFS) and Longitudinal Worker File (LWF).

Appendix C

Sampling weights to account for the Labour Force Survey complex survey design

The Labour Force Survey (LFS) sample is drawn from an area frame and is based on a stratified, multi-stage design that uses probability sampling. First, Canada's population in provinces and regions is partitioned into strata. Instead of selecting the dwellings in the strata directly, a sample of small well-defined areas called *clusters* is selected in each stratum in the first stage of sampling. All dwellings within selected clusters are listed, and a sample of dwellings is chosen from each list in the second stage of sampling. A handful of three-stage strata are created in Quebec, Ontario, Alberta, and British Columbia to handle isolated urban centres.

In addition to accounting for the different probabilities of selection into the sample as well as accounting for non-response and coverage issues, one should also control for clustering and stratification of the survey design in order to obtain the correct standard error. While stratification typically increases the precision of the parameter estimates, the clustering of the sample will usually reduce it. Two weights are of particular relevance to the variance estimates from descriptive and multivariate analysis from the LFS Tabulations (TABS) files: 1) sub-weights (*SUBWT*); and 2) final weights (*FINALWT*). The final weights are used to produce the group means estimates in the paper so that the figures are generated on the basis of population counts consistent with census projections. The final weights incorporate auxiliary information such as census population estimates and the common sample between two consecutive months of survey data. For the multivariate analysis in the paper, sub-weights are used as the sampling weights instead of the final weights. In fact, the sub-weights and the final weights can both be used in the multivariate analyses. Both of these weights take into account the complex design features in the LFS. However, since there is no closed-form solution to adjust for standard errors by means of the final weights when using general statistics software (such as STATA), one may use the sub-weights, given the complexity of using the final weights. The use of sub-weights in the analysis would yield, in general, more conservative estimates (in terms of larger standard errors).

Standard statistical packages like STATA can produce standard errors that account for complex survey design. This can be done by using the SVY commands when sampling weights, stratification, and clustering scheme are identified. Since 1976, LFS data have been collected by means of four different sample designs, drawing on updated information from decennial censuses. These different sample designs cover the periods 1975-to-1984, 1985-to-1994, 1995-to-2004, and 2005-to-present. While sample design identifiers are available on the LFS data files for the years 1997 to present, they are not available on earlier files and must be derived. See Chan (2011) for a more detailed discussion of how the appropriate standard errors can be computed by using the LFS data.

Appendix D

Occupational classification

In this paper, occupations are aggregated into the following five categories based on the National Occupational Classification for Statistics (NOC-S) 2001 codes: 1) Management; 2) Professionals; 3) Semi-professionals and technicians; 4) Clerical, sales, and service personnel; 5) Manual workers and trades personnel.

"Management" includes: senior managers (A0); specialist managers (A1); managers in retail trade, food, and accommodation services (A2); and other managers (A3).

"Professionals" includes: professional occupations in business and finance (B0); professional occupations in natural and applied sciences (C0); professional occupations in health (D0); nurse supervisors and registered nurses (D1); judges, lawyers, psychologists, social workers, ministers of religion, policy and program officers (E0); teachers and professors (E1); and professional occupations in art and culture (F0).

"Semi-professionals and technicians" includes: technical occupations related to natural and applied sciences (C1); technical and related occupations in health (D2); paralegals, social services workers, and occupations in education and religion (E2); and technical occupations in art, culture, recreation, and sport (F1).

"Clerical, sales, and service personnel" includes: finance and insurance administrative occupations (B1); secretaries (B2); administrative and regulatory occupations (B3); clerical supervisors (B4); clerical occupations (B5); assisting occupations in support of health services (D3); sales and service supervisors (G0); wholesale, technical, insurance, real estate sales specialists, and retail, wholesale, and grain buyers (G1); retail salespersons and sales clerks (G2); cashiers (G3); chefs and cooks (G4); occupations in food and beverage service (G5); occupations in protective services (G6); occupations in travel and accommodation including attendants in recreation and sport (G7); childcare and home support workers (G8); and other sales and service occupations (G9).

"Manual workers and trades personnel" includes: contractors and supervisors in trades and transportation (H0); construction trades (H1); stationary engineers, power station operators, and electrical trades and telecommunications occupations (H2); machinists, metal forming, shaping, and erecting occupations (H3); mechanics (H4); other trades (H5); heavy equipment and crane operators including drillers (H6); transportation equipment operators and related workers, excluding labourers (H7); trades helpers, construction and transportation labourers, and related occupations (H8); occupations unique to agriculture excluding labourers (I0); occupations unique to forestry operations, mining, oil and gas extraction, and fishing, excluding labourers (I1); primary production labourers (I2); supervisors in manufacturing (J0); machine operators in manufacturing (J1); assemblers in manufacturing (J2); and labourers in processing, manufacturing, and utilities (J3).

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